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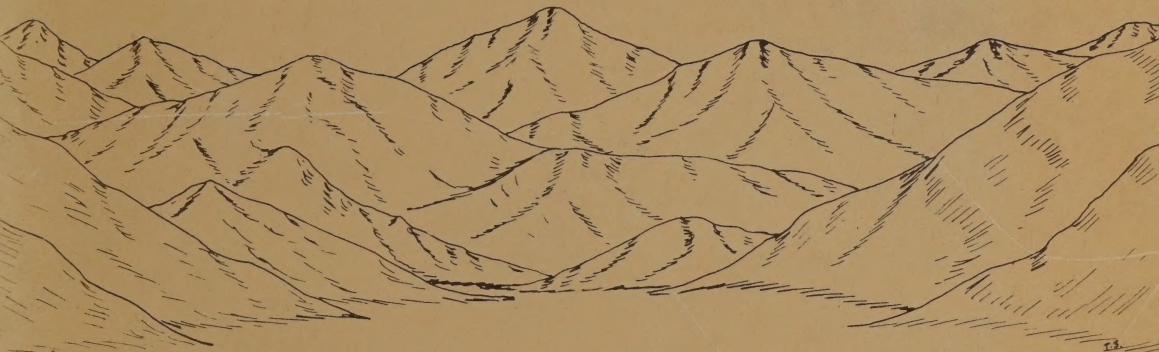


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DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BIG HORN BASIN PROJECT

WORLAND DISTRICT

WYOMING

SEPTEMBER 1962

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BIG HORN BASIN PROJECT

WYOMING DISTRICT

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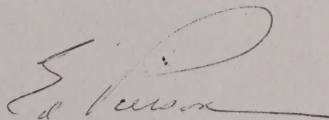
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F O R E W O R D

The Big Horn Basin Project includes the Worland Grazing District together with other public lands lying outside of the District Boundary, but administered by that District. The area embraces the major portion of the Big Horn Basin proper. Since the District's inception, improvement in natural resources conditions and realization of their potential have been limited due to restricted programs. The economy of the Big Horn Basin, based primarily on the available natural resources, is lacking in stability.

The Big Horn Basin Project, as set forth in the following pages, outlines an orderly, well planned solution to many problems of resource management, development, and use which will contribute to stabilizing the Big Horn Basin's economy.

Materials used in preparing this report were obtained from the University of Wyoming, the Wyoming State Natural Resources Board, and various public documents. Compilation was accomplished by Bureau of Land Management personnel located in the Worland District and Wyoming State Offices.



Ed Pierson
Wyoming State Director
Bureau of Land Management
September 28, 1962

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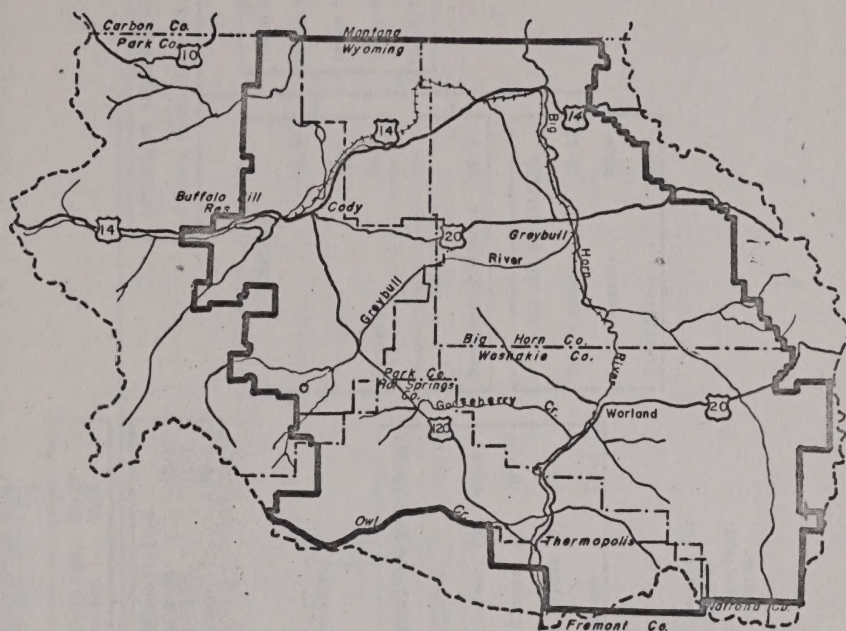
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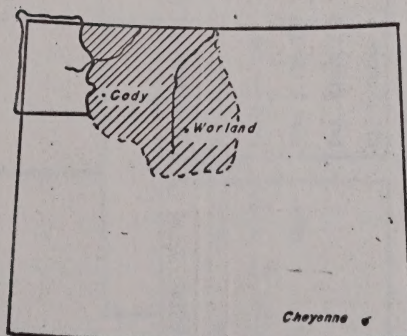
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Big Horn Basin, Wyoming

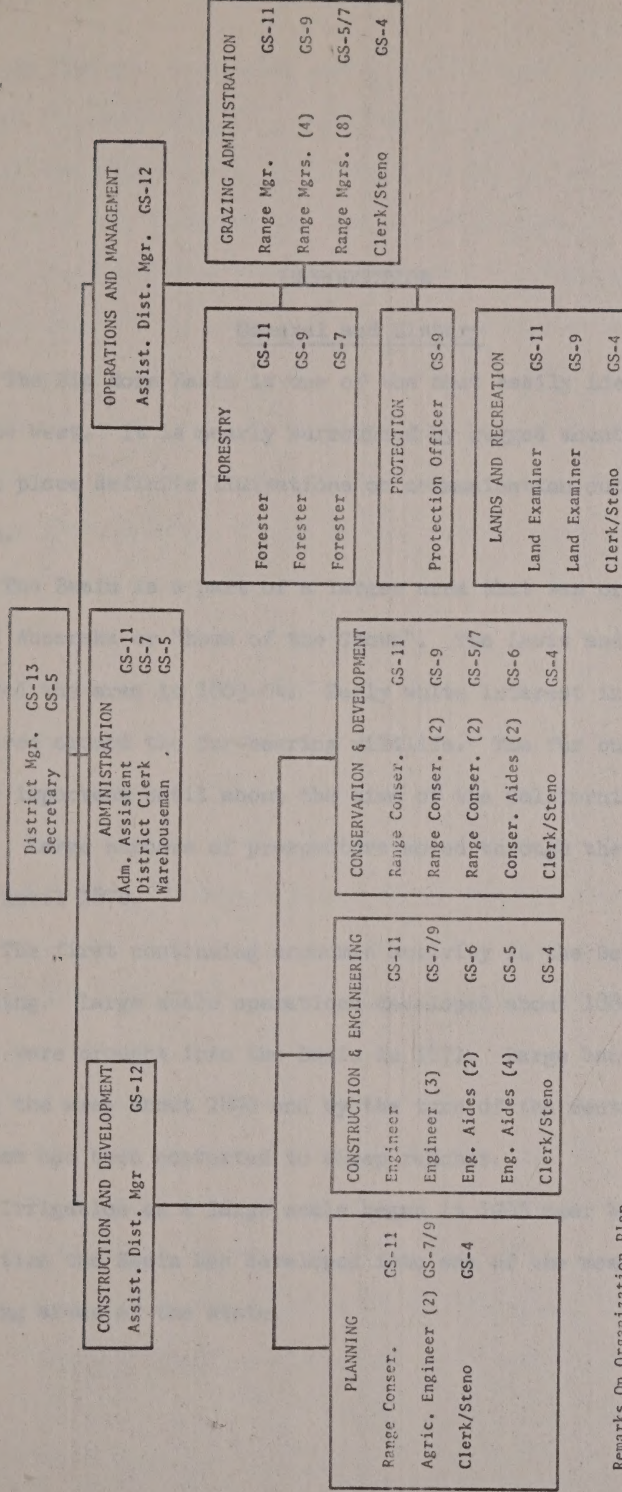


- Project Boundary**
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Location Map

ORGANIZATION PLAN



Remarks On Organization Plan
 The organization chart represents the initial staffing and duty assignments for the Big Horn Basin Project. This Basic District organization will require supplementation to reach the full steady program level as the project develops. Temporary field employees will be employed as necessary to meet the program requirements during the field work seasons.

INTRODUCTION

General and History

The Big Horn Basin is one of the most easily identified basins in the West. It is nearly surrounded by rugged mountain ranges which place definite limitations on communication outside of the Basin.

The Basin is a part of a larger area that was originally designated Absaroka or "home of the Crows". The Lewis and Clark expedition entered the area in 1803-04. Early white interest in the Basin was centered around the fur-bearing wildlife. The fur business continued to be important until about the time of the California gold rush in 1849. Large numbers of prospectors moved through the Basin from this time until 1870.

The first continuing economic activity in the Basin was cattle ranching. Large scale operations developed about 1880. The first sheep were brought into the Basin in 1871. Large bands began utilizing the area about 1890 and by the turn of the century many cattle ranches had been converted to sheep ranches.

Irrigation on a large scale began in 1903 near Worland. Since that time the Basin has developed into one of the most important farming areas of the state.

The Chicago, Burlington and Quincy Railroad was completed through the Basin in 1912. Bus lines, freight truck lines and an airline are also in use. U. S. Highways 20, 14 and 16, as well as oiled state and county roads, link up the population centers of the Basin. These highways serve as major access routes to Yellowstone National Park to the west, and to the Great Plains east of the Big Horn Mountains.

The first oil well in the Basin was drilled in 1888. Today, the oil and gas industry ranks closely behind agriculture in the economy of the basin. Mining, at one time of major significance, has steadily declined since World War II.

Physiography

The mountains and foothills which form the broad rim of the Basin are generally rugged. The highest point is Cloud Peak in the Big Horn Mountains, with an elevation of 13,165 feet. The Basin floor is made up of a series of benches and terraces varying from 4-5 thousand feet in elevation, broken up by numerous water courses with narrow valleys. Much of the area has a "badland" aspect. Many portions are potentially good range and other portions are suitable for irrigation development.

The Big Horn River system drains the Basin, except for the northwest corner which is drained by Clark's Fork of the Yellowstone River. Major tributaries of the Big Horn are the Shoshone and Greybull Rivers, which form in the Absaroka Range to the West. Several small creeks enter the Basin from the east, along the west slope of the Big Horn Mountains which is relatively arid.

Climate

The climate of the Big Horn Basin is generally arid in character. Moisture from the Pacific Ocean and the Gulf of Mexico is deposited on the exterior slopes of the high mountain ranges surrounding the basin. Considerable variation in precipitation exists within the basin. Average amounts range from 11.2 inches at Cody to 5.6 inches at Powell.

Temperatures within the Basin vary from extreme cold in the winter to extreme heat in the summer. These extremes range from -50° to 110° . The mean average summer temperature of the basin is 60.5° and the mean average winter temperature 30.2° .

Soils

The soils of the Basin may be categorized as follows: mountain, upland and bottomland soils. The mountain soils are derived from igneous rocks and consist of greyish-brown loams and sandy loams. The upland soils are derived from shales and have developed in place. They consist of shallow, stony loams, greyish-brown loams, and alkali clays and loams. The bottomland soils are mainly alluvial in nature and vary from gravelly sand, clay and sand to sandy loams. All have gravelly subsoils. They are also characterized by a horizon of lime 8" to 12" below the surface.

Land Status

Land ownership status within the Big Horn Basin is varied. In the center of the Basin, with the exception of lands adjacent to water courses, public lands predominate. On the periphery of the Basin the land status is more complex, with intermingling of all classes of ownership. Bureau of Reclamation withdrawn lands and

Forest Service lands are significant.

Natural Resources

The natural resources of the Basin include an abundance of salable, leasable and locatable mineral resources; valuable forage resources for domestic livestock and wild game; merchantable timber and other forest products; water; wildlife; and scenic attractions of great significance.

1. Minerals: Locatable minerals found within the Basin include gold (lode and placer), iron (magnetite and hematite), lead, manganese, asbestos, vermiculite, talc, copper, uranium, silver, tungsten, bentonite clays, lithuim, feldspar, fluorite, jade, mica, sulphur, sodium, beryl and titanium.

Leasable minerals found within the Basin include oil, gas, coal, phosphate, alum and nitrates.

Salable mineral materials found within the Basin include: gypsum, scoria, stone (limestone, sandstone, dolomite and marble), glass sand, sand and gravel.

The value of mineral production in the Basin in 1960 exceeded \$177 million, primarily from petroleum. Petroleum production is expanding yearly, although the outlook for future production of locatable and salable minerals is dim, except in specific instances.

2. Forage Resources: The forage resources of all types of lands in the Big Horn Basin provide year around livestock feed. The 4 million acres of national land reserve in the Basin supply approximately 305,000 AUM's of forage for both cattle and sheep. Cattle use the public lands mainly in the spring, summer and fall,

in many cases spending part of the summer on the National Forest or higher elevation private rangelands. In late fall and winter private base lands are utilized for feeding on bean chaff, sugar beet tops, and hay.

Sheep use the public lands in spring, fall and winter, spending the summer months on Forest lands and leased private or public lands at the higher elevations. Usually the sheep spend late fall and early winter on private lands feeding on sugar beet tops and bean straw. Supplemental feeding during periods of adverse winter weather is practiced when necessary.

3. Forest Resources: The Basin has 1.5 million acres of forested lands, with an allowable cut of 27 million feet of sawtimber and 110 thousand cords of smaller material. About 70 per cent of this acreage and cut is located on the National Forests and about 10 per cent on Bureau of Land Management lands. The remainder is on Indian and private lands. To date, little use has been made of this resource mainly because of freight rates, and local reluctance to use native lumber.

4. Recreation: Recreation resources of the Basin are outstanding. Tourists passing to and from Yellowstone National Park traverse the Basin. Many spend vacations at dude ranches and contribute a large share to the economy. Extensive numbers of big game animals (deer, elk, moose, bear), small game animals and birds draw many out-of-state hunters into the area. Fishing within the Basin floor is limited. However, the fishing in the foothills and mountains provides sport for many people. With the completion

of Yellowtail Dam on the Big Horn River, a major recreation area will be provided.

5. Water Resources: Surface water available for use in the Basin is derived from melting snow in the surrounding mountains and is of major importance for irrigated farming. The flood plains of the Big Horn River and its tributaries are saturated coarse alluvial material. Where these deposits are thick enough, good wells are obtained at depths between 100 and 300 feet. Where these beds lie over shale formations, the water becomes highly mineralized. Thermal pools located in the southern end of the Basin serve as major health resorts.

Another source of water in the Basin is the tertiary rock beds. They exist in complex series of interbedded lenticular shale and sandstone beds. Due to their wide extent they constitute a major source of livestock water.

PRESENT SITUATION

The economy of the Big Horn Basin is supported by five major industries. In descending order of importance they include: agriculture; oil and gas production; outdoor recreation, including tourism, dude ranching and other travelers; and mining. A potential industry of major importance to the Basin is forestry, although at the present time it is relatively untapped.

1. Agriculture: Agricultural income is derived largely from livestock production, although cash crops are also fairly important. Since the Basin is an arid region, both are necessarily dependent on irrigation. It provides the means for producing the cash crops. It

also provides much of the supplemental pasture and feeds necessary for the all-important range livestock industry.

Irrigation has been influential in the establishment and growth of the range livestock industry which accounts for nearly 60 per cent of the total agricultural income in the Basin. To a certain extent it has also been responsible for some of today's problems in range-land management.

2. Oil and Gas: The petroleum industry is second only to agriculture in the Basin. This importance is reflected both in actual production and in manufacturing. A large percentage of the exportable product comes from the five refineries in the Basin. The Big Horn Basin has the largest oil producing field in Wyoming, located at Elk Basin. The Worland field is Wyoming's biggest gas producer. Market value of petroleum products doubled between 1950 and 1957 reaching in excess of \$100,000,000. . In 1960, the value approached \$175,000,000. Mechanization and automation in the petroleum industry however is gradually decreasing employment opportunities.

3. Manufacturing: Manufacturing ranks third in overall importance, including two sugar factories, a vegetable cannery, and a tile plant - all of which produce goods for export outside the Basin. Many smaller factories produce various items for local consumption. Value added to raw materials by processing amounted to \$9,950,000 in 1950. The local market absorbed \$2,260,000 of this and the balance was exported.

4. Recreation: The recreation and tourist business in the Basin adds significantly to the total income. The mountain

vacationland opportunities in the Absaroka and Big Horn Mountains entice many tourists and hunters to this area as does Yellowstone Park to the West. Construction of Yellowtail Dam will add to these attractions and increase the demand for public campgrounds, roadside parks and picnic grounds. The combined income realized by the Basin in 1950 from dudes, tourists, and other travelers exceeded \$5,000,000. The trend to pickup "campers", station wagon-tent campers, and trailer campers, has produced a noticeable increase in the demand for roadside areas for overnight camping and picnicking facilities. Such areas have not been developed and the few in existence are not being managed or policed. There is a constant demand for suitable maps by this segment of the public. Such maps, depicting land status and location of available facilities, are badly needed for sale or distribution to the tourist and outdoorsman.

5. Mining: The mining industry consists of coal, bentonite, sulphur, shale, sand and gravel. In total, this industry is of minor importance to the Basin's economy. Coal production has declined since World War II due to competition with natural gas. Current coal production is mainly for consumption in the Basin. Due to outside competition and lack of a local consumer market the future of mining in the Basin is not bright. Bentonite out-crops are found in the foothills along the western and southern sides of the Basin. Deposits showing greatest commercial promise are located in the vicinity of Greybull. Production from a mill erected near Greybull had increased from 22,860 tons in 1951 to 287,090 tons in 1956.

6. A forest products industry in the Big Horn Basin is relatively underdeveloped although the forest resources are considerable. Six medium-sized sawmills, 1 million to 5 million board feet produced annually, are in operation in various portions of the Basin. In addition, close to a dozen small portable mills, up to 1 million board feet annually, are also in operation.

Public Lands

During the summer months sheep and cattle graze the higher elevation lands administered by the Forest Service and Bureau of Land Management. During the fall, winter and spring livestock depend on lower elevation ranges, administered primarily by the Bureau of Land Management. Supplemental feeds which are largely locally grown on private lands are also important. Where the severe winter of 1886-1887 served to reduce cattle and sheep numbers in line with the sustained carrying capacity of the ranges, the development of a supplemental feed supply through irrigation made it possible in subsequent years to winter more livestock than the ranges could support during the grazing season.

A gradual deterioration of the ranges resulted. This downward trend was not arrested, in general, on the three million acres of public domain lands in the Basin until after passage of the Taylor Grazing Act. The deterioration which resulted from pioneer day development of this industry manifested itself in many ways. Perennial grass ranges have given way to annual grasses and forbes. Where continued heavy use remained, there has been a further degeneration to annual noxious and poisonous weeds.

Stock trails and wagon trails became the avenues of early mechanized traffic. These routes were worn to ruts that became waterways and eventual gullies. Wind, sheet, and water erosion has removed precious top soil which cannot be replaced. Abnormally high silt loads rapidly fill reservoirs and reduce water quality for irrigation, domestic use, and downstream fish and waterfowl habitat. The absence of a planned road system has resulted in the establishment of many special purpose roads and trails which were ill conceived and not maintained. Consequently, many have been abandoned or relocated as they became impassable, adding to the general deterioration of the area. Seismograph roads and trails have further aggravated the situation.

In the quarter century since passage of the Taylor Grazing Act, management has become more pronounced. Adjustments have been made in grazing licenses to alleviate the pressure of overgrazing. From a maximum permitted livestock use during the War years of 1944 of 95,000 animal units, consuming 471,696 animal unit months of forage, total use within the Worland District has been reduced to 89,768 animal units consuming 304,203 animal unit months of feed. Development of range improvements has provided better control and assisted in partial restoration of depleted ranges.

Despite the efforts made to date, thousands of acres remain untreated, and are still in a static or deteriorating condition; showing no perceptible improvement. The low rainfall common to the Basin is conducive to rapid degeneration, and conversely, permits very slow natural recovery. Under intensive management and

with the aid of scientific advances in range rehabilitation, lands in poor to fair condition will require many years to make significant restoration. Intensive management accompanied by accelerated land treatment is a must if the trend in condition is to be reversed and productivity restored.

Fire protection presently afforded the public lands within the Big Horn Basin is considerably below minimum standards in relation to fire potential and area administered. Fire equipment is predominantly of World War II vintage, being obtained through surplus disposal on no planned, orderly basis. Detection services (e.g. fire lookouts, radio, aerial surveys) have not kept pace with technological advancements in the field.

Survey and detection of disease and insect infestation plaguing forest resources is less than adequate. Control of forest insects and disease is far below desirable levels.

Timber sales, main tool of the forest manager, are at the present time practically nonexistent in the Basin. First and foremost is the lack of sawmills in the Basin. There are a few, but most have been forced out of business due to the depressed lumber market. The lack of access roads also hampers operators in this area. The small operator cannot afford the capital investment necessary to build roads. The raw material is available to provide a sustained yield production unit, but transportation facilities must be developed to allow a fair investment return to lumber manufacturers.

The problems of wildlife management have not received the

professional attention needed, considering their importance to the local economy and overall impact on land management. Problem areas include inadequate harvest of big game animals and lack of habitat management. A comprehensive program is needed to determine present game population levels, desired population levels, and present and potential forage requirements of big game animals. Similar studies are necessary with regard to upland game bird habitat to assure the future of upland game bird hunting. The potential of warm water fisheries management in the Basin needs direct attention.

At present land surveys in the Basin are inadequate. A total of 50 townships need resurveys to permit proper land management and to allow definite location of facilities and to identify land ownership status. Original monuments have deteriorated to the point where they are not locatable. Demands for small tracts are not being met and thus inhibiting the material wealth, investment and income of the Basin. Constant demands for detailed maps by county and local government and private industry are not being met.

Recreation development within the Basin is seriously limited. Roadside rest areas and campground facilities for the numerous travelers through the Basin are almost nonexistent. No major developments for recreation purposes exist today.

PROGRAM NEEDS

IN ORDER TO REMEDY THE PRESENT SITUATION IN THE BIG HORN BASIN, MAJOR PROJECT PHASE NEEDS ARE OUTLINED BELOW. DETAILS AS TO COSTS, EQUIPMENT, AND MANPOWER NEEDS ARE PRESENTED IN FOLLOWING SECTIONS.

1. RANGE MANAGEMENT: THE PRIMARY OBJECTIVE OF THE RANGE

MANAGEMENT PHASE OF THE PROJECT IS TO REALIZE THE MAXIMUM SUSTAINED FORAGE YIELD POSSIBLE ON THE LANDS LOCATED WITHIN THE BASIN. ADEQUATE INFORMATION ON THE CAPABILITIES OF THE PUBLIC LANDS MUST BE GATHERED THROUGH A COMPREHENSIVE INVENTORY. ADJUDICATION OF BASE PROPERTY QUALIFICATIONS WITH SUBSEQUENT ADJUSTMENTS IN USE TO OBTAIN A PROPERLY BALANCED LIVESTOCK OPERATION MUST BE COMPLETED. INTENSIFIED RANGE USE SUPERVISION WILL OF NECESSITY BE REQUIRED TO ACCOMPLISH MANAGEMENT OBJECTIVES. AN INTENSIVE INFORMATION PROGRAM DIRECTED TOWARD EDUCATING RANGE USERS OF THE BENEFITS ACCRUING FROM PROPER USE MUST COINCIDE WITH THE RANGE DEVELOPMENT PROGRAM.

2. RANGE AND FOREST PROTECTION: THE LONG RANGE OBJECTIVE OF THE RANGE AND FOREST PROTECTION PHASE OF THE PROGRAM IS AIMED AT REDUCING THE INCIDENCE OF FIRE, DISEASE, AND INSECT INFESTATIONS TO A MINIMUM. THE EXPECTED INCREASED FORAGE PRODUCTION AND INTENSIFIED PUBLIC USE WHICH WILL RESULT AS THE OVERALL BASIN PROJECT PROGRESSES WILL DEMAND INCREASED ATTENTION TO THIS PHASE OF ACTIVITIES.

THE FIRE PRESUPPRESSION READINESS LEVEL WITHIN THE PROJECT AREA IS WHOLLY INADEQUATE --- LACKING IN TRAINED MANPOWER, SUFFICIENT COMMUNICATIONS, DETECTION SERVICES AND EFFECTIVE FIRE FIGHTING EQUIPMENT. THE PROGRAM FOR PUBLIC EDUCATION AS TO THE CAUSES AND RESULTS OF WILD FIRE MUST BE GIVEN GREATER EMPHASIS. THIS IS PARTICULARLY TRUE WITH THE INCREASED RISK RESULTING FROM MORE FREQUENT USE OF THE NATIONAL LAND RESERVE AS THE PROJECT DEVELOPS.

INCREASED EMPHASIS MUST BE PLACED ON DETERMINING THE EXTENT OF INSECT AND DISEASE DAMAGE TO MATURE AND OVERMATURE TIMBER STANDS WHICH

ARE HIGHLY SUSCEPTIBLE TO INFECTION, INFESTATION AND WILD FIRE. TIMBER TRESPASS SURVEYS REQUIRE GREATER ATTENTION.

3. RESOURCE DEVELOPMENT: THE RESOURCE DEVELOPMENT PHASE OF THE PROJECT IS DESIGNED TO COMPLEMENT THE RANGE MANAGEMENT PROGRAM IN REALIZING MAXIMUM FORAGE PRODUCTION THROUGH LAND TREATMENT AND WATER DEVELOPMENT ACTIVITIES. IN ADDITION, CONSTRUCTION OF WATER CONTROL FACILITIES ARE DESIGNED TO RETARD SOIL EROSION AND REHABILITATE DEPLETED LANDS.

4. FOREST MANAGEMENT: THE PRIMARY OBJECTIVE OF THE FOREST MANAGEMENT PHASE OF THE PROJECT IS TO ESTABLISH A SYSTEM OF SUSTAINED YIELD WITH DETERMINATION OF ANNUAL ALLOWABLE HARVESTS. DISTRIBUTION OF AGE CLASSES, SIZE, MORTALITY AND ACREAGES OF MERCHANTABLE TIMBER WITHIN THE BASIN MUST BE DETERMINED THROUGH A COMPREHENSIVE FOREST INVENTORY. ACCESS ROUTES TO LARGE BLOCKS OF MATURE TIMBER MUST BE OPENED. INCREASED EMPHASIS MUST BE PLACED ON DEVELOPING CONSUMER ACCEPTANCE AND PREFERENCE FOR LOCAL FOREST PRODUCTS.

5. FOREST DEVELOPMENT: THE FOREST DEVELOPMENT PHASE OF THE PROJECT AUGMENTS FOREST MANAGEMENT THROUGH REHABILITATION OF DEVASTATED TIMBER LANDS AND REALIZATION OF THE FOREST PRODUCTION POTENTIAL OF LANDS SUITABLE FOR ESTABLISHMENT OF TIMBER STANDS.

6. CADASTRAL SURVEYS: BASIC TO LAND TENURE, PROJECT DEVELOPMENT, INSTALLATION OF FACILITIES, AND OTHER PROPER LAND MANAGEMENT PROGRAMS IS THE DETERMINATION OF PRECISE LAND LOCATIONS. SURVEY NEEDS NECESSARY TO ACCOMPLISH THE OBJECTIVES OF ALL PHASES OF THE BIG HORN BASIN PROJECT AMOUNT TO 50 TOWNSHIPS CONTAINING 1,150,000 ACRES.

7. LANDS: THE PRIMARY OBJECTIVE OF THE LANDS PHASE OF THE PROJECT IS THE PROPER CLASSIFICATION OF PUBLIC LANDS AS TO TENURE AND MOST SUITABLE USE IN THE PUBLIC INTEREST. IN ORDER TO ACCOMPLISH THIS OBJECTIVE A COMPREHENSIVE INVENTORY AND APPRAISAL OF THE LAND RESOURCE IS NEEDED. DETAILED ANALYSIS OF THE INVENTORY AND APPRAISAL WILL PROVIDE THE KEY TO PROTECTION, RETENTION, OR DISPOSAL OF PUBLIC LANDS AS PUBLIC NEEDS DICTATE. PROVISION OF LANDS INFORMATION SERVICES TO THE LOCAL POPULACE IS A NECESSITY.

8. RECREATION: THE DEVELOPMENT OF A SOUND AND COMPREHENSIVE RECREATION PROGRAM WITHIN THE BASIN AREA IS NEEDED (1) TO PROVIDE TRANSIENT RECREATION OUTLETS, (2) TO IMPROVE PUBLIC LAND MANAGEMENT, (3) TO REDUCE INDISCRIMINATE USE OF THE LANDS AND (4) TO DECREASE THE FIRE RISK PROBLEM THAT ACCOMPANIES UNRESTRICTED OUTDOOR ACTIVITIES. RECREATION OUTLETS MEETING THE NEEDS OF THE BASIN RESIDENTS MUST ALSO BE PROVIDED THROUGH (1) TRANSFER OF SUITABLE SITES TO LOCAL JURISDICTIONS OR (2) THROUGH BUREAU PLANNING, DEVELOPMENT AND CONSTRUCTION OF RECREATION FACILITIES.

9. MINERALS: THE BASIC OBJECTIVE OF THE MINERALS PROGRAM IS TO DETERMINE PRECISELY THE EXTENT OF THE MINERALS RESOURCE WITHIN THE BIG HORN BASIN AND TO PROVIDE FOR ITS CONSERVATION AND ORDERLY DEVELOPMENT. THE MINERALS INVENTORY IS A PREREQUISITE TO THE DEVELOPMENT OF OTHER PHASES OF THE OVERALL PROJECT. PRESENT AMOUNTS, LOCATIONS, AND AREAS OF MINERAL CLAIMS ARE ILL DEFINED.

10. ROAD CONSTRUCTION: A PREREQUISITE TO PROVIDING NECESSARY ACCESS FOR MULTIPLE PUBLIC USE OF THE FEDERAL LANDS, AS WELL AS FOR ORDERLY DEVELOPMENT OF ALL PHASES OF THE PROJECT, IS THE CONSTRUCTION

OF AN IMPROVED ROAD NETWORK TOTALING 572 MILES. THIS NETWORK PROVIDES FOR THE FOLLOWING CLASSES AND AMOUNTS OF ROADS:

CLASS I - 24 FOOT ROAD, SURFACED - 38 MILES

CLASS II - 20 FOOT ROAD, GRADED - 116 MILES

CLASS III - 12 FOOT ROAD, GRADED - 418 MILES

11. PROJECT FACILITIES CONSTRUCTION: INCIDENT TO PLANNING, ACTION AND COMPLETION OF THE BIG HORN BASIN PROJECT IS THE CONSTRUCTION OF HEADQUARTERS AND OPERATIONAL FACILITIES. THESE FACILITIES INCLUDE A HEADQUARTER OFFICE, WAREHOUSING, OPERATION CAMPS AND FIRE LOOKOUTS AND CAMPS.

PROJECT BENEFITS

On the average, each dollar brought into a Wyoming area creates 86 cents in additional business in its turnover from hand to hand before being spent outside the area.^{1/} A dollar received by a rancher for the sale of livestock tends to create more local business than other dollars spent in a community. Further, a rancher makes purchases and sales to other local farms and tends to purchase most products locally. Statistically, the dollar brought into the economy by anyone engaged in agriculture circulates 2.32 times. These facts provide a sound base for estimating economic benefits of the Big Horn Basin Project.

1. Range Management: The project's intensified range management plan has as a goal the revitalizing of the public lands within the Big Horn Basin. A reversal of the downward trend is anticipated.

^{1/} Richard E. Lund, Unpublished Research Study, Division of Business and Economic Research, University of Wyoming

The Soil Conservation Service and the Missouri River Basin studies place particular emphasis on range condition as a factor of production. Indications are that silty upland sites in good condition in the 5" - 9" rainfall belts have a 50 percent higher carrying capacity than the same range in fair condition. Range in fair condition is given twice the carrying capacity of range in poor condition.

A sampling of federal range in the Basin provides the following estimated percentage breakdown of range conditions: Excellent, 1 percent; Good, 6 percent; Fair, 50 percent: and Poor and Bad, 43 percent.

The amount of forage on public lands within the Basin is presently estimated to properly support 135,000 animal units for one month.

Through management intensified by project action, it is estimated that 50 percent of the project area can be raised to a good condition, increasing the carrying capacity on this land by 50 percent or approximately 34,000 animal unit months annually. It is also estimated that the land now rated poor to bad can be raised to fair condition with an increase of 174,000 animal unit months annually. Increased production is estimated at a total of 208,000 animal unit months. Using an animal unit month value of \$2, a total value of \$416,000 annually would result.

The additional 208,000 animal unit months which could be produced on the federal range would provide a stable and continuing five month grazing season for an estimated 41,500 animal units of livestock. With the present livestock class distribution of 50 percent

sheep and 50 percent cattle, additional grazing for 21,000 cattle and 103,000 sheep would be provided in the Basin.

From this increased livestock, 57,680 cwt. of lamb could be grown at a gross income of \$808,000; 1,030,000 pounds of wool at a gross of \$41,000; and 94,500 cwt. of beef at an income of \$2,079,000. A total gross income of \$2,928,000 would result. Of this amount, approximately \$2,723,000 would be added to the Basin economy.

The total increased net worth to the agricultural economy realized from increased forage and livestock production would be approximately \$3,3139,000. Economic benefit to the Basin of 2.32 times this amount, or \$7,282,480 annually, would be realized.

The increased livestock numbers would also provide an increase in tax revenue to the county governments. At an evaluation of \$40 each, the 21,000 cattle would result in a total valuation of \$840,000. At an evaluation of \$4.50 each, 103,000 sheep would result in a total valuation of \$463,500. The combined valuation increase of \$1,303,500, with a tax rate of \$45 per thousand, would provide tax revenues of \$58,700 per year.

The handling of the additional 41,500 animal units in the Basin would require the employment of an additional 150 men. In total, these men would spend approximately \$150,000 a year with the local merchants.

The total direct benefits from this program to the Big Horn Basin would be a significant \$10,827,480 annually, after the full effects of the project program have been developed.

Intangible benefits are also to be gained from the Big Horn Basin project. They include sediment control, increased attractiveness of the Basin itself, improved wildlife habitat and a sense of well being among the users of the public domain. Above all, a saving of the natural range resource would result. At the present time the range resource is well on the way to becoming an annual range, deteriorated to such a degree that it could never be completely rehabilitated.

2. Range and Forest Protection: Fire presuppression benefits will result from the decreased cost of suppressing fires in the Basin as well as from holding the damages to forest products, forage and watersheds to a minimum. The cost of suppressing the Rattlesnake Mountain Fire in 1960 amounted to \$398,392. In addition to these suppression costs, there was a dollar damage value of \$200,690 for loss of forest products, forage and watershed. Further, \$91,840 was spent for the cost of rehabilitating the burned over land in order to prevent loss from erosion and nonproductivity of the land. The total cost of fire suppression, damages and rehabilitation on this one fire amounted to approximately \$690,992. This cost was more than one-half the total Fire Presuppression program (\$1,082,785) on public lands, including Alaska. The completion of the presuppression program of the "Project" would practically eliminate the possibility of such costly fires by having the proper attack force on a starting fire before it is allowed to spread beyond control.

In addition to such dollar savings, there are many intangible benefits from reducing the burned area to a minimum. These values include the preservation of wildlife habitat and aesthetic

recreational factors.

3. Resource Development: The major benefits of the resource development phase of the project are difficult to analyze in terms of specific dollar amounts. These benefits will be reflected in savings through increasing the longevity of large water storage structures located many miles downstream from the Basin, including the Yellowtail Reservoir at the northern edge of the Basin. The magnitude of the silt load entering the Big Horn River from the Basin is demonstrated by the Geological Survey's measurements on the Big Horn River at Kane, which will be the upper end of the Yellowtail Reservoir. Here the average annual flow of the Big Horn River is 1,633,000 acre feet of water, with an average sediment load of 3,800,000 tons of soil.

The benefits of a detention structure program have been demonstrated in the partially completed Fifteen Mile Creek watershed located in the Big Horn Basin. The records of the Fifteen Mile Creek show an average annual discharge of 4813 acre feet of water and a sediment load of 549,000 tons of soil, or an average of 114 tons of sediment per acre foot of water. After partial treatment of this watershed, the records show a decrease to 90 tons of silt per acre foot of water in 1959 and a further reduction to 78 tons in 1960, a total reduction of 32 percent to date. The period of flow of water has also been markedly changed. Prior to construction of detention structures in this drainage, flood waters passed within a few days. Now the water is retained and discharged gradually over a six week period.

Major land treatments programed are contour furrowing, seeding, and chemical control of sagebrush. It is estimated that these treatments will produce five to six times more forage for both livestock and big game. The increased protective cover will stabilize the soil. With an increase of five times the available forage, a direct benefit of \$4.50 per acre would be realized over a ten year period, using the \$2.00 an animal unit month value figure. The scheduled treatment area involves 191,000 acres, resulting in a direct benefit of \$859,500 and an overall Basin benefit of 2.32 times this amount, or \$1,994,000.

The proposed watershed treatment will serve the wildlife and recreation phases of the project equally well. The increase in small bodies of water will provide habitat for waterfowl through increased cover and feed. Roads built into the treated areas will be frequented by local people on trips for rock collecting and small game hunting.

The community and area as a whole would receive an economic boost from the initiation of the project. A pay roll directly to employees would be approximately \$300,000. An additional one and a half million dollars would be disbursed in the area over the ten year period through contractors and contractual services.

4. Forest Management: Benefits derived from the forest management program would be a stimulus to the economic and social condition of the Big Horn Basin.

With an anticipated annual allowable cut of 4 million board feet of lumber plus sales of other forest products, gross revenues

to the federal government would be about \$35,000 annually.

This timber product could be sold as a finished product for the sum of \$340,000. The resources grown in the Big Horn Basin, manufactured properly, could be marketed in the Basin thereby returning much of the total expenditures in the immediate vicinity of manufacturing.

To fully utilize the constant potential resource, several saw-mills would move into the Basin. These mills would employ from 10-20 persons. The woods operations of each operator would employ an anticipated 18-20 persons. Increased BIM personnel necessary to carry out the program would place salary monies into the economy of the Basin.

A constant demand exists for good quality lumber in the Big Horn Basin for home building and improvement, industrial improvement and ranch construction material.

The total increased salary monies from private and federal agencies placed in circulation in the Basin would approach \$125,000. The value factor for this product indicates it would provide a total return of \$600,000.

Intangible benefits would be realized through the unspoiled waters resulting from improved watersheds. Higher aesthetic values would be realized under the forestry phase of the program, adding to the recreational value of the Basin.

5. Recreation: The development of adequate camping and recreational facilities will become an added attraction for the area. With the knowledge that the public will be able to camp with the degree of comfort now considered necessary by a large segment of the population,

many additional tourists and hunters will visit the area. The added visitors stopping overnight or for short periods will visit one or more local communities to obtain food and fuel. This additional spending will add significantly to the economy of the area during the summer and fall season.

The poor condition of the present trail and road system in the Basin is such that public use and access to the public lands is severely limited. In addition, considerable time is lost by BIM personnel due to the necessarily slow rate of travel from one point to another. The extremely primitive condition of these trails materially increases the repair and upkeep of vehicles as well as causes loss of time while awaiting repairs.

The general upgrading of the roads with the installation of drainage structures would materially enhance public access and reduce road maintenance costs. The timing of road construction under the system will provide definite savings in other phases of the project, as the roads will be placed before other work is initiated.

COST SUMMARY OF SELECTED PROJECT FEATURES

	<u>Activity</u>	<u>FY ' 65</u>	<u>Total Project</u>
Range Management and Protection			
Administration of Grazing Land	103.1	\$176,000	\$1,042,000
Fire Presuppression	103.2	<u>34,000</u>	<u>362,000</u>
Total Range Management and Protection	103	\$210,000	\$1,404,000

Rehabilitation Improvement and Conservation of Soil and Moisture

Soil and Moisture Conservation	106		
Land Use Planning	106	\$147,000	\$1,100,000
Studies and Investigations	106	10,000	100,000
Soil Stabilization	106	148,000	1,541,000
Water Management Practices			
Water Development	106	386,000	1,930,000
Water Control	106	<u>67,000</u>	<u>3,388,000</u>
Total Water Management		453,000	5,318,000
Other	106	<u>94,000</u>	<u>850,000</u>
Total Soil and Moisture Conservation	106	\$852,000	\$8,909,000
Weed Control	110	51,000	877,000
Range Improvement	801	<u>80,000</u>	<u>577,000</u>
Total Rehabilitation, Improvement and Conservation of Soil and Moisture		\$983,000	\$10,363,000

Forest Management, Development and Protection

Forest Management	104.21	\$43,000	\$ 165,000
Forest Development	104.23	62,000	1,475,000
Forest Protection	104.22	<u>7,000</u>	<u>45,000</u>
Total Forest Management, Development and Protection	104.2	112,000	1,685,000
Cadastral Survey	105	43,000	632,000

Lands & Minerals & Recreation

Planning	102.21	2,000	26,000
Lands	102.21	31,000	405,000
Minerals	102.22	<u>6,000</u>	<u>190,000</u>
Total Lands & Minerals & Recreation Planning	102.00	39,000	621,000

Construction and Maintenance of Roads, Buildings and Recreation Facilities

Construction Roads	201		
Class I	38 miles	-----	\$ 760,000
Class II	116 miles	\$215,000	1,392,000
Class III	418 miles	<u>166,000</u>	<u>3,135,000</u>
Total Road Construction		\$381,000	\$5,287,000
Construction Building	202	206,000	251,000
Construction Recreation Facilities	203	<u>35,000</u>	<u>494,000</u>
Total Construction	200	\$622,000	\$6,032,000

Maintenance

Maintenance Roads	107.00	-----	\$ 305,000
Maintenance Buildings	109.10	\$ 1,000	79,000
Maintenance Recreation Facilities	109.20	-----	83,000
Total Maintenance		<u>1,000</u>	<u>467,000</u>
Total Construction & Maintenance		\$623,000	\$6,499,000

TOTAL BY APPROPRIATION

MANAGEMENT OF LANDS AND RESOURCES	100.00	1,308,000	14,595,000
CONSTRUCTION	200.00	622,000	6,032,000
RANGE IMPROVEMENTS	800.00	<u>80,000</u>	<u>577,000</u>
PROJECT GRAND TOTAL		\$2,010,000	\$21,204,000

AN ACTION PROGRAM

The action plan of the Project envisions little or no increase in project workload the initial year (1965) over that previously scheduled in the regular Bureau program. It does place strong emphasis on an orderly sequence of investigation, inventory, planning and development. The initial two years are devoted

primarily to the preliminary facets of the total project. Development and construction will reach full scale operation in the ensuing years.

THE INITIAL YEAR

1. Cadastral Surveys and Lands and Minerals Program: During this period approximately 79,000 acres will require a cadastral resurvey to establish control for future operations. The Lands program, including tenure analysis, recreation planning and classification will comprise an important facet of the project during the initial year. Final determinations with regard to retention, disposal, and use will influence all other aspects of the project. Development plans in turn will place demands on the lands function for easements, rights-of-way, and other type classifications. The current minerals inventory program will continue during the initial year, completing 101,000 acres.

2. Construction: The road construction program has been designed to facilitate management and will precede resource development. This construction will involve three major types of roads which are generally built to classification standards as follows:

Class I - 24 foot road, surfaced

Class II - 20 foot road, graded

Class III - 12 foot road, graded

During the first year construction will take place primarily within the Nowater Community Watershed, consisting of 47 miles of Class II and II roads.

3. Range Management: Resource inventory and adjudication of

approximately 1.5 million acres, or 35 percent of the total job, will be completed. Updating of the protection program to meet current needs and to place this activity in readiness for subsequent years will involve construction of fire camps and lookouts, and the acquisition of three pumper units. Intensive planning will constitute a major portion of operations in resource development the first two years. Construction will be limited to necessary fences, water developments, and such other practices as will directly facilitate the management program.

4. Forest Management: The forest management program will concentrate on an inventory to be completed by Fiscal Year 1966. A re-inventory is not contemplated prior to Fiscal Year 1968. Management plans are a must and will receive parallel attention. Revisions and refinements will be a continuing function. Timber sales are tentatively established at 4 million board feet per annum, through Fiscal Year 1969. Following completion and analysis of the inventory a more realistic allowable cut can be established. Concurrent with the layout of sales will be the compilation of current appraisal data. A forest development program, non-existent at the present time, will be initiated the first year, as will a forest protection program.

5. Recreation: The recreation program will include the development of two campgrounds presently planned and needed to meet current demand. In addition, the surveying and designing of facilities to be constructed in future years will be completed.

FIVE YEAR GOALS

1. Cadastral Survey and Lands and Minerals Program: During this

period 865,000 acres are scheduled for cadastral survey treatment. The survey schedule is timed to follow initial analysis of lands and precede detailed analysis, as well as major construction, land tenure adjustments, small tract actions and recreation site developments.

The rate of accomplishment in the minerals inventory will be increased during this period to include 1,619,000 acres. In this manner, the minerals program will parallel and support other resource management programs in addition to providing the overall minerals inventory.

2. Construction: The goal in road construction during the initial five year period is as follows:

<u>F.Y.</u>	<u>Class Road</u>	<u>Miles</u>	<u>Community Watershed</u>
1965	II	18	Nowater
	III	29	Nowater
1966	III	22	Sand Creek-Cottonwood
1967	III	16	Kirby-Buffalo
1968	II	30	Upper Nowood
	III	32	Upper Nowood
1969	III	93	Alkali

Roads constructed will be graded, multiple purpose access roads.

3. Range Management: Completion of the resource inventory and adjudication is scheduled for this period. During the last two years detailed allotment management will receive increased emphasis as range users are able to adjust their operations to obtain more efficient use and benefit of an improved resource.

4. Range and Forest Protection: By the end of this period the protection program will be tooled up to meet potential requirements. Equipment, communications systems, fire crew housing and detection facilities will be operational. The presuppression organization will be sufficiently decentralized and mobile to effect minimum attack and control time. Firebreaks in high hazard areas will be constructed and on a maintenance basis. Hazard reduction will be 50 percent complete in forested areas and 75 percent complete in areas adjacent to campgrounds and major access roads.

5. Resource Development: The major goal in resource development will be that of constructing all facilities which bear directly on improved management and administration of the national land reserve. All major water development requirements and one-half of the protective fencing needed will be completed. Similar emphasis will be placed on land treatment work. Construction of water control structures will constitute the final phase in development and be of minor importance during this period.

6. Forest Management: In addition to completion of the forest inventory, and development and refinement of management plans, a total of 20 million board feet of timber sales is scheduled for completion in forest management. As timber sales increase, improved local processing and market demand can be expected to develop.

Following initial establishment of the forest development program an expanded program during the five-year period will witness reforestation of 3,000 acres of commercial timber lands, site improvement on 24,500 acres, and stand improvement on 1,900 acres.

7. Recreation: During the first five years of the program, plans and designs for a majority of the campgrounds included in the recreation program will be completed. Acquisition of required lands and access will be completed for the main sites. Over two-thirds of the campground construction is scheduled for completion. Completed facilities serving the needs of an expanded population will be opened to the public.

REMAINING TO BE DONE

The program remaining after the first five year period will include maintenance, intensive management and major construction.

1. Cadastral Survey and Lands and Minerals Program: The system of lands surveys are used by private individuals and public agencies alike. Remonumentation of obscure and poorly marked surveys on a remaining 285,000 acres will be of considerable benefit to the public and administering agencies through savings in time and engineering costs where absolute identification is required. The lands function will be a continuing program as outlined in the five year goals. Following this five year period, there will remain in excess of 2,000,000 acres on which minerals inventory is to be completed.

2. Construction: There will be 332 miles of road remaining to be constructed. This will include 27 miles of recreation roads, 53 miles of timber management roads and 178 miles of range management. There will be a total of 38 miles of surfaced 24 foot roads, 68 miles of graded 20 foot roads, and 226 miles of graded 12 foot roads.

3. Range Management: At this point in time, grazing

administration will be concentrating on detailed or intensive management coordinated with the rehabilitation resulting from land treatment practices completed in the resource development program. Recognizing that conditions will not remain static, there will be a continuing workload in adjustments and refinements caused by changing ownership of base operations and other developments affecting the lands involved.

Part of this workload will be one of education and training in efficient management of the resource base. This will also be true of the protection aspects where enforcement and additional hazard reduction of approximately 600 acres of forested lands will add to the major workload.

4. Resource Development: In addition to maintenance of existing projects, a sizeable workload in land treatment practices and water control structures will remain. The latter will be delayed until this period as benefits are of an indirect nature and the size and number of erosion control structures may vary as full benefits of land treatment and management become evident. By the end of the ten year period an estimated 35 percent of the needed water control structures will be completed.

5. Forest Management: As the forest inventory nears completion, local processing plants become established, and markets develop, timber sales are expected to increase. Compilation of current appraisal data will be a continuing full time activity in order that lumbering concerns will have the closest possible margin by which to arrive at fair stumpage prices. Likewise, in forest development the program

remaining after the first five years will be larger than that already accomplished. This is especially true in reforestation and timber stand improvement where better than 70 percent of the total job will remain.

6. Recreation: The major program remaining in recreation will be that of maintenance, and administration. There will also remain the construction of facilities for twelve recreation sites.

A P P E N D I X

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Project Schedules

Project Maps

TABLE 1

LAND OWNERSHIP, BIG HORN BASIN, 1958

Acreage by County in Thousands of Acres

OWNERSHIP	COUNTIES				TOTALS	
	BIG HORN	HOT SPRINGS	PARK	WASHAKIE	ACRES	PER CENT
Federal Bureaus:						
Land Management	1,134.0	481.4	481.3	924.9	3,021.6	37.19
Reclamation	86.7	1.5	266.0	3.4	357.6	4.40
Indian Affairs		161.0			161.0	1.98
Other Federal	3.6				3.6	.05
Forest Service	356.1	53.4	1,686.6	34.8	2,130.9	26.23
Sub-Total — Federal	1,580.4	697.3	2,433.9	963.1	5,674.7	69.85
State & Local Lands	110.0	197.2	173.1	143.6	624.9	7.69
Private Lands	341.3	399.6	731.9	341.0	1,813.8	22.33
Water Surface	.6		10.2		10.8	.13
TOTALS	2,033.3	1,294.1	3,349.1	1,447.7	8,124.2	100.0

Source: Compiled from unpublished records of various agencies, 1958

TABLE 2
AVERAGE TEMPERATURE AND LENGTH OF GROWING SEASON, BIG HORN BASIN

STATION	ELEVATION (Feet)	TEMP. LENGTH OF RECORD (Years)	TEMPERATURE		AVERAGE APRIL TO SEPT. MINIMUM	PRECIPITATION LENGTH OF RECORD (Years)	AVERAGE LENGTH OF GROWING SEASON (Days)	AVERAGE DATE OF KILLING FROST	
			ANNUAL AVERAGE	MAXIMUM				LAST IN SPRING (Date)	FIRST IN FALL (Date)
Basin	3,860	47	46.3	79.8	45.9	49	131	May 15	Sept. 23
Cody	5,090	46	45.5	73.2	43.6	46	125	May 22	Sept. 25
Lovell	3,825	39	44.8	75.9	44.3	44	120	May 17	Sept. 15
Powell	4,378	45	45.6	75.2	45.7	47	131	May 16	Sept. 24
Thermopolis	4,313	43	46.0	79.4	43.0	45	106	June 4	Sept. 20
Worland	4,061	40	44.4	77.1	44.3	43	125	May 17	Sept. 19

Source: Compiled from U. S. Department of Commerce, Weather Bureau, "Climatological Data, Wyoming Annual Summary, 1940-1956."

TABLE 3
LAND UTILIZATION, BIG HORN BASIN
(Acres)

OWNED OR ADMINISTRATED BY:	FORESTED AND OTHER LAND	GRAZING AND WASTE		IRRIGATED CROPLAND	IRRIGATED PASTURE	URBAN	TOTAL
		IRRIGABLE	NON-IRRIGABLE				
Federal Government	2,130,841	98,000	3,441,712			547	5,671,100
State of Wyoming	38,603		590,351			1146	630,100
Individuals and Corporations	62,268	22,273	1,469,751	227,954	23,975	6,000	1,812,200
TOTAL	2,231,712	120,273	5,501,814	227,954	23,975	7,693	8,113,400
PER CENT	27.5%	1.5%	67.8%	3.0%	1.1%	.1%	100.0%
		69.3%		3.1%			

Sources: Unpublished data from: 1. State Land Office, 2. U. S. Forest Service, 3. Bureau of Land Management, 4. Assessors, and 5. Published data from U. S. *Census of Agriculture, 1914.*

TABLE 4
ESTIMATED CASH FARM INCOME
1930 - 1953
IN THOUSANDS OF DOLLARS

YEAR	LIVESTOCK AND LIVESTOCK PRODUCTS ^a	CROPS ^a	GOVERNMENT PAYMENTS ^b	TOTAL
1930	6,739.8	4,077.8		10,817.6
1931	5,681.5	2,653.7		8,335.2
1932	3,759.7	1,823.9		5,583.6
1933	4,308.8	2,686.3	9.9	7,005.0
1934	7,260.2	3,074.5	764.9	11,099.6
1935	6,901.2	2,968.9	261.8	10,131.9
1936	7,864.6	4,613.2	161.9	12,639.7
1937	8,920.9	4,570.3	624.1	14,115.3
1938	7,185.2	2,830.8	605.4	10,621.4
1939	7,737.7	2,730.8	704.3	11,172.8
1940	10,111.4	3,024.4	725.7	13,861.5
1941	13,871.7	3,525.5	596.1	17,993.3
1942	16,958.7	5,322.3	850.0	23,131.0
1943	18,715.9	6,840.8	452.2	26,008.9
1944	15,379.1	7,787.8	637.7	23,804.6
1945	16,248.1	7,022.7	680.9	23,951.7
1946	19,438.4	11,617.8	515.2	31,571.4
1947	25,491.0	13,396.7	678.6	39,566.3
1948	27,375.9	12,194.5	439.0	40,009.4
1949	18,806.6	10,321.4	518.1	29,646.1
1950	22,364.1	9,887.5	686.5	32,938.1
1951	20,480.0	6,845.0	650.5	27,975.5
1952	16,252.0	8,922.0	643.4	25,817.4
1953	13,493.0	8,738.0	687.1	22,918.1

Sources:

- a. Estimated from statewide farm income figures of the Agricultural Marketing Service.
- b. Reports of Agricultural Conservation Service.

TABLE 5
ASSESSED VALUATION OF CITY AND TOWN PROPERTY AND TAXES LEVIED IN 1957
BIG HORN BASIN

City or Town	County	Municipal Valuation	State	County	Levies in Mills		Total
					School Tax	Municipal	
Basin	Big Horn	1,220,756	1.5	9.67	37.00	15.00	63.17
Byron	Big Horn	125,846	1.5	10.50	22.80	8.00	42.80
Cowley	Big Horn	182,777	1.5	12.90	35.00	15.00	64.40
Deaver	Big Horn	90,794	1.5	12.68	26.38	8.00	48.56
Greybull	Big Horn	1,892,265	1.5	12.67	24.00	18.00	56.17
Lovell	Big Horn	1,943,931	1.5	9.90	28.50	23.00	62.90
Manderson	Big Horn	120,264	1.5	9.67	27.50	28.00	66.67
E. Thermopolis	Hot Springs	71,186	1.5	8.209	28.600	14.400	52.709
Kirby	Hot Springs	67,549	1.5	8.290	20.761	0	30.551
Thermopolis	Hot Springs	3,387,581	1.5	8.209	28.600	13.213	51.522
Cody	Park	4,769,240	1.5	8.150	36.770	6.000	52.420
Meeteetse	Park	294,492	1.5	5.410	26.330	8.000	41.240
Powell	Park	4,101,082	1.5	7.200	33.070	7.000	48.770
Tensleep	Washakie	174,821	1.5	7.140	18.749	20.012	47.401
Worland	Washakie	6,051,551	1.5	7.140	26.013	15.177	49.830
State Average		2,508,230	1.5	9.613	25.855	11.367	48.335

Source: Annual Report, State Board of Equalization, 1956.

TABLE 6
GROSS INCOME DERIVED FROM
SALES OF RETAIL AND SERVICE
FIRMS TO TOURISTS BIG HORN
BASIN, 1950

(Thousands of Dollars)

GRAND TOTAL	2,307.7
Total Retail	1,717.7
Total Service	590.0
Retail Firms:	
Clothing Stores	54.8
General Stores	26.0
Variety, Jewelry, & Misc.	86.9
Furniture	7.4
Hardware, Paint, & Glass	5.4
Food Stores	162.0
Cafes & Restaurants	544.5
Bars & Package Stores	89.4
Automotive Establishments	738.8
Other	2.5
Service Firms:	
Laundries & Dry Cleaners	2.7
Beauty & Barber Shops	6.3
Photography Studios	9.8
Hotels and Motels	474.7
Auto Repairing Establishments	65.2
Recreation Establishments	25.9
Other Establishments	5.4

Source: Original research.

TABLE 7

PLANNED ROAD CONSTRUCTION , BY TYPE CLASS AND
WATERSHED LOCATION , BIG HORN BASIN PROJECT

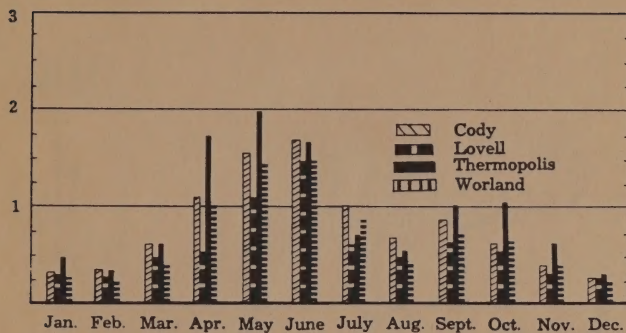
WATERSHED	TYPE ROAD							
	CLASS ⁽¹⁾ 1		CLASS ⁽²⁾ 2		CLASS ⁽³⁾ 3		TOTAL	
	Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost
Upper Nowood			30	360,000	32	240,000	62	600,000
Nowater			18	216,000	29	217,500	47	433,500
Kirby - Buffalo					16	120,000	16	120,000
Gooseberry					19	142,500	19	142,500
Cottonwood - Owl Creek	15	300,000	21	252,000	20	150,000	56	702,000
Fifteen Mile	9	180,000	38	456,000	35	262,500	82	898,500
Five Mile - Elk Creek					17	127,500	17	127,500
Sand - Cottonwood Creek					22	165,000	22	165,000
Alkali - Brokenback	9	180,000			84	630,000	93	810,000
Shell	5	100,000			48	360,000	53	460,000
Lower Dry Creek					3	22,500	3	22,500
Little Mtn. - Bear Creek					28	210,000	28	210,000
Shoshone			9	108,000	41	307,500	50	415,500
Upper Dry Creek					4	30,000	4	30,000
Clarks Fork					13	97,500	13	97,500
Greybull					7	52,500	7	52,500
TOTAL	38	760,000	116	1,392,000	418	3,135,000	572	5,287,000

(1) 24 foot road, graded and surfaced

(2) 20 foot road, graded

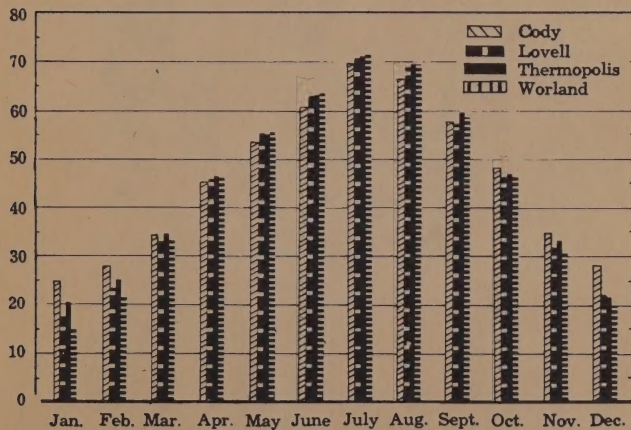
(3) 12 foot road, graded

FIGURE 1
NORMAL MONTHLY PRECIPITATION
AT SELECTED STATIONS IN THE BIG HORN BASIN



Source: U. S. Department of Commerce, Weather Bureau, "Wyoming Annual Summary, 1916."

FIGURE 2
NORMAL MONTHLY TEMPERATURE
AT SELECTED STATIONS IN THE BIG HORN BASIN



Source: Compiled from U. S. Department of Commerce, Weather Bureau, "Climatological Data, Wyoming Annual Summary, 1916."

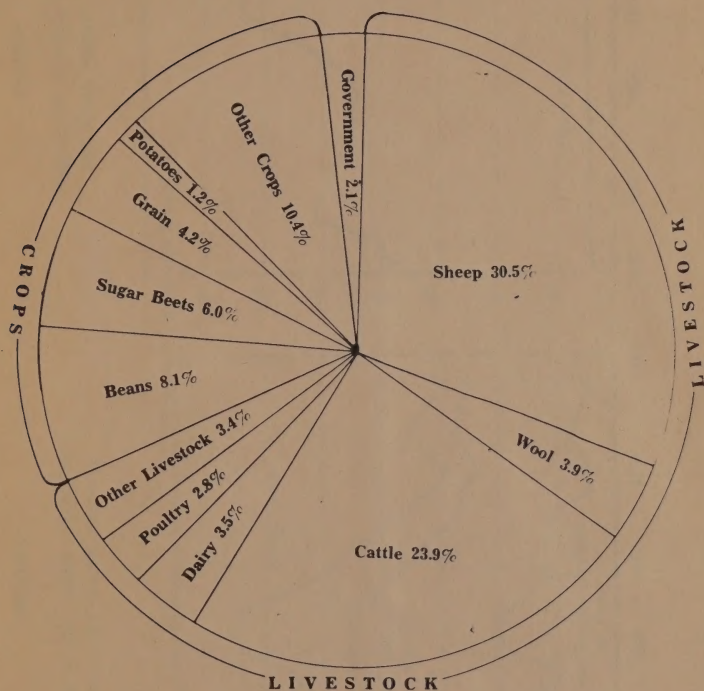


FIGURE 3
LAND USE WITHIN BIG HORN BASIN

Sources: Senate Doc. 191, and others, 1950.

FIGURE 4

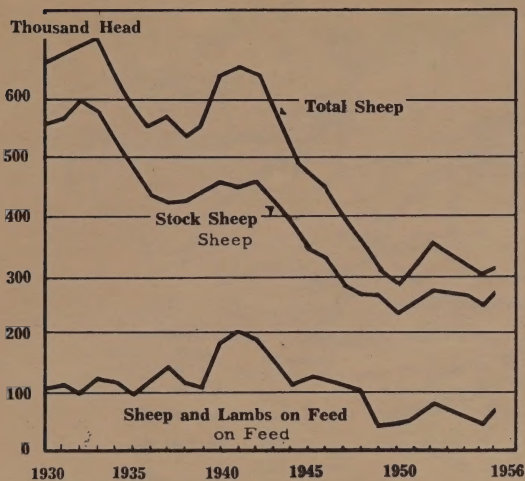
SOURCES OF AGRICULTURAL INCOME
BIG HORN BASIN, 1950



Source: Estimates based on county data derived by the State Federal Agricultural Statistician, Cheyenne, Wyo.

FIGURE 5

TREND IN SHEEP NUMBERS
BIG HORN BASIN, 1930-1956



Source: State-Federal Agricultural Statistician.

FIGURE 6

TREND IN CATTLE NUMBERS
BIG HORN BASIN, 1930-1956

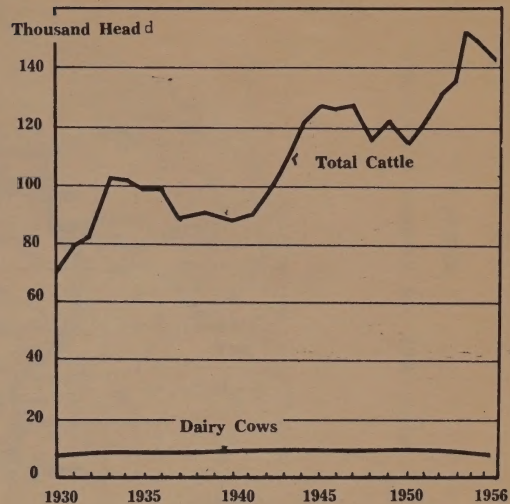
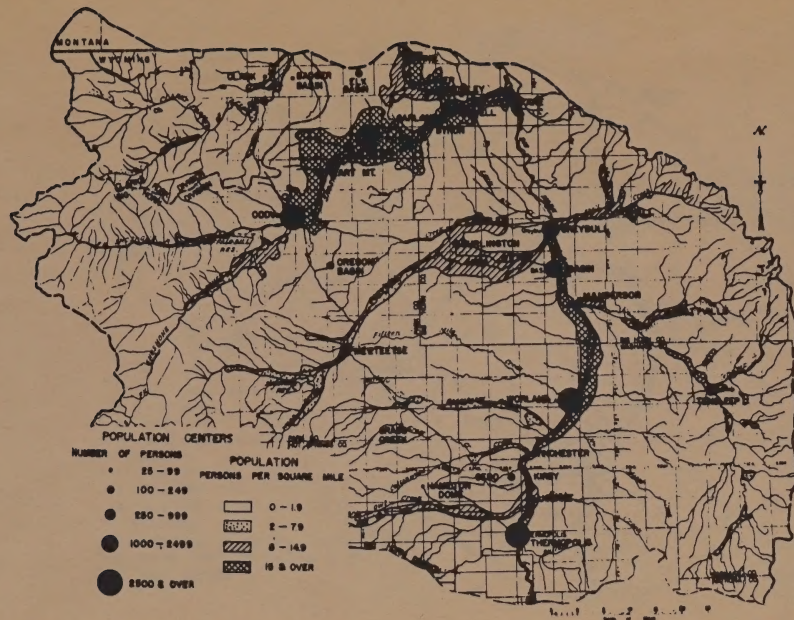


FIGURE 7
POPULATION DENSITY, BIG HORN BASIN



Source: Compiled and drawn by Big Horn District, Bureau of Reclamation, 1910.

FIGURE 8

TRADING CENTERS AND COMMUNICATIONS, BIG HORN BASIN

Source: Compiled and drawn by Big Horn District, Bureau of Reclamation, 1950.



Source: Compiled and drawn by the Big Horn District, Bureau of Reclamation.

FIGURE 9
LOCATION OF PROCESSING PLANTS, BIG HORN BASIN, 1950

Project Name
Sighorn Basin Project

[illegible]

PROJECT SCHEDULE

RANGE MANAGEMENT AND PROTECTION

Project Feature	Unit	Control Field	Activity	Work Code	State	Office	Total		Prior Years		Fiscal Year 65		Fiscal Year 66		Fiscal Year 67		Fiscal Year 68		Fiscal Year 69		Balance as Complete 70-74		
							Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units
Fire Suppression:							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Education	Man Mo.		10320210	4901			29	20			2	2	3	2	3	2	3	2	3	2	15	10	
Investigation & Enforcement	Man Mo.		10320220	4901			52	41			2	2	3	2	6	5	6	5	6	5	30	25	
Hazard Reduction	Acres		10320230	4901			100	0			0	0	70	1	70	1	80	2	80	2	100	2	
Planning & Training	Man Mo.		10320310	4901			82	61			4	3	6	5	9	7	9	7	9	7	45	35	
Equipment, Tools & Supplies	- -		10320320	4901			70					14		24		20		6		6		0	
Detection	Man Mo.		10320340	4901			71	66			1	4	6	6	8	7	8	7	8	7	40	35	
Program Services	Man Mo.		10320100	4901			300	90			30	9	30	9	30	9	30	9	30	9	150	45	
Total	Man Mo.		10320000	4901			535	362			39	34	48	49	56	51	56	38	56	38	280	152	
Total Range Management and Protection	Man Mo.		10320000	4901			258	114			297	210	282	205	294	201	218	218	218	118	128	4	552

UNITED STATES

PROJECT SCHEDULE

1. Contact Name

REHABILITATION, IMPROVEMENT AND CONSERVATION OF SOIL AND MOISTURE

[illegible]

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROJECT SCHEDULE

Project Name
Big Horn Basin

REHABILITATION, IMPROVEMENT AND CONSERVATION OF SOIL AND MOISTURE

Project Feature	Unit	Control Field	Activity	Work Code	State	Office	Total		Fiscal Year		Fiscal Year 65		Fiscal Year 66		Fiscal Year 67		Fiscal Year 68		Fiscal Year 69		Balance to Complete 70 + 74		
							Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	
Need Control							1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75																
Studies and Investigation								1 0 0				1 0		1 0		1 0		1 0		1 0		5 0	
Soil Stabilization Practices	Acres (100's)							4 0 0	1 7 6			2 0	9	3 0	1 3	4 0	1 8	5 0	2 2	5 0	2 2	3 1 0	9 2
Brush Control	Acres (100's)							5 5 0	5 5 0			3 0	3 0	3 0	3 0	5 0	5 0	5 0	5 0	5 0	5 0	3 4 0	3 4 0
Seeding & Contouring	Acres (100's)							8 0	4 0			1	1	2	1	3	2	3	2	5	3	6 0	3 1
Other	Acres (100's)																						
Program Services	Man Mo.							1 2	1 1			1	1	1	1	1	1	2	2	2	2	5	4
Total - Need Control	Man Mo.							8 7 6	8 7 7			2 5	5 1	2 5	5 5	7 3	8 1	7 4	8 6	7 4	8 7	6 0 5	5 1 7
Range Improvement																							
Soil Stabilization Practices																							
Fences	Miles							2 0 0	2 6 0			2 0	2 6	2 0	2 6	2 0	2 6	2 0	2 6	2 0	2 6	1 0 0	1 3 0
Water Management Practices																							
Water Development	Number							2 0 0	2 4 5			4 0	4 9	4 0	4 9	4 0	4 9	4 0	4 9	4 0	4 9		
Maintenance								5 0				3		4		5		5		5		2 8	
Program Services	Man Mo.							2 4	2 2			2	2	2	2	2	2	2	2	2	2	1 4	1 2
Total - Range Improvement	Man Mo.							2 4	5 7 7			2	8 0	2	8 1	2	8 2	2	8 2	2	8 2	1 4	1 7 0
TOTAL - Need Control and Range Improvement								8 9 0	1 0 6 2			9 8 1	9 8 8	1 1 3 5	1 2 9 6		1 4 1 4					4 5 4 7	

PROJECT SCHEDULE

FOREST MANAGEMENT, DEVELOPMENT AND PROTECTION

[illegible]

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROJECT SCHEDULE

Project Name
Pir Horn Basin Project

FOREST MANAGEMENT, DEVELOPMENT AND PROTECTION

Project Feature	Unit	Control Field	Activity	Work Code	State	Office	Total		Prior Years		Fiscal Year <u>65</u>		Fiscal Year <u>66</u>		Fiscal Year <u>67</u>		Fiscal Year <u>68</u>		Fiscal Year <u>69</u>		Balance to Complete 70-74	
							Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)
Forest Development:																						
Plans & Surveys	Ac.(100's)		10423	2004901			24	80			4	16	5	16	5	16	5	16	5	16		
Site Improvement	Ac.(10's)		10423	3104901			24	400			50	10	200	40	400	80	400	80	400	80		
Reforestation	Ac.(10's)		10423	3204901			1000	600			50	30	50	30	50	30	75	45	75	45		
Stand Improvement	Ac.(10's)		10423	3304901			1000	300			10	2	20	6	40	12	50	15	70	21		
Cooperative Studies	--		10423	4004901				0005														
Program Services	Man-Mos.		10423	1004901			100	010			2	2	2	2	2	2	2	2	2	2		
Total	Man-Mos.		10423	0004901			478	1475			20	62	31	95	44	141	51	159	53	165	279	853
Forest Protection:																						
Hazard Reduction	Acres		10422	2304901			1000	20			100	2	100	2	100	2	100	2	100	2		
Fire Breaks	Miles		10422	2404901			10	25			2	5	2	5	2	5	2	5	2	5		
Total	Man-Mos.		10422	0004901			30	45			4	7	4	7	4	7	4	7	4	7	10	10
Total, Forest Management,																						
Development & Protection	Man-Mos.		10400	0004901			763	1686			90	112	80	133	90	178	98	194	96	197	309	869

PROJECT ADMINISTRATION

Project Name
Big Horn Basin Project

LANDS AND MINERALS MANAGEMENT AND RECREATION PLANNING

[illegible]

PROJECT SCHEDULE
CADASTRAL SURVEY

[illegible]

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Project Name
Big Horn Basin

PROJECT SCHEDULE

CONSTRUCTION AND MAINTENANCE OF ROADS, BUILDINGS AND RECREATION FACILITIES

Project Feature	Unit	Control Field	Activity	Work Code	Site	Office	Total		Watershed Years		Nowater Fiscal Year 65		Sand Cr. Cotton-wood Year 66		Kirby Buffalo Year 67		Upper Noyod Year 68		Alkali Fiscal Year 69		Balance as Complete 70 - 74		
							Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	
Construction - Roads																							
Survey & Design	Man Mo.		2 0 1 0 0	2 0 0 4 9 0 1			8 5 0	4 8 0				3 6	2 0	6 3	3 5	1 0 0	5 6	1 2 1	6 8	1 2 1	6 9	4 0 9	2 3 2
Access and Acquisition	Man Mo.		2 0 1 0 0	3 0 0 4 9 0 1			1 3	1 2				1	1	1	2	1	1	2	2	2	2	6	4
Construction	Miles		2 0 1 0 0	4 1 0 4 9 0 1			5 7 2	4 7 6 5				4 7	3 5 8	2 2	1 6 5	1 6	1 2 0	6 2	4 5 5	9 3	6 9 7	3 3 2	2 9 6 0
Appraisal & Purchase	Man Mo.		2 0 1 0 0	5 0 0 4 9 0 1			1 4	1 2				1	1	1	1	1	1	2	2	2	7	5	
Program Service	Man Mo.		2 0 1 0 0	1 0 0 4 9 0 1			2 2	1 8				1	1	2	2	2	2	3	2	3	2	1 1	9
Total - Road Construction (Includes Man Mo. Supervision)	Man Mo.		2 0 1 0 0	0 0 0 4 9 0 1			1 6 9	9 5 2 8 7				8 0	3 8 1	1 3 7	2 0 5	2 0 4	1 8 0	2 5 8	5 3 9	2 5 8	7 7 2	7 6 2	3 2 1 0
Construction - Buildings																							
Survey & Design	Man Mo.		2 0 2 0 0	2 0 0 4 9 0 1			2	2				2	2	0	0	0	0	0	0	0	0	0	0
Construction	Sites		2 0 2 0 0	4 2 0 4 9 0 1			1 0	2 4 9				8	2 0 4	2	4 5	0	0	0	0	0	0	0	0
Total - Building Construction	Man Mo.		2 0 2 0 0	0 0 0 4 9 0 1			1 6	2 5 1				1 4	2 0 6	2	4 5	0	0	0	0	0	0	0	0
Construction - Recreation Facilities																							
Survey & Design	Man Mo.		2 0 3 0 0	2 0 0 4 9 0 1			4 8	4 0				1 2	1 0	1 2	1 0	6	5	6	5	6	5	6	5
Access and Acquisition	Man Mo.		2 0 3 0 0	3 0 0 4 9 0 1			1 4	7 0				2	2	2	1 0	2	1 0	2	1 1	2	1 1	4	2 6
Construction	Sites		2 0 3 0 0	4 3 0 4 9 0 1			4 5	2 8 7				2	2 2	7	4 3	7	4 3	8	4 9	8	5 0	1 3	8 0

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Project Name
Big Horn Basin

PROJECT SCHEDULE

CONSTRUCTION AND MAINTENANCE OF ROADS, BUILDINGS AND RECREATION FACILITIES

Project Feature	Unit	Control Field	Activity	Work Code	State	Office	Total		Prior Years		Fiscal Year 65		Fiscal Year 66		Fiscal Year 67		Fiscal Year 68		Fiscal Year 69		Balance to Complete 70 - 74	
							Units		Cost (\$1000)		Units		Cost (\$1000)		Units		Cost (\$1000)		Units		Cost (\$1000)	
							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Appraisal and Purchase	Man Mo.		2	0	3	0	0	5	0	0	4	9	0	1	5	8	9					
Program Services	Man Mo.		2	0	3	0	0	1	0	0	4	9	0	1	1	0	8					
TOTAL - Construction Recreation Facilities	Man Mo.		2	0	3	0	0	7	7	4	9	0	1	7	7	4	9	0	1	1	1	1
TOTAL - Construction of Roads, Buildings and Recreation Facilities	Man Mo.		2	0	0	0	0	0	0	0	4	9	0	1	1	8	5	6	0	3	2	
Maintenance of Roads																						
Condition, Survey & Plans	Miles.		1	0	7	0	0	2	0	0	4	9	0	1	1	1	8	9				
Maintenance Work	Miles		1	0	7	0	0	3	0	0	4	9	0	1	1	1	8	9				
Studies & Analyses	Man Mo.		1	0	7	0	0	4	0	0	4	9	0	1	1	0	9					
Program Services	Man Mo.		1	0	7	0	0	1	0	0	4	9	0	1	1	7	1	4				
Total - Road Maintenance	Man Mo.		1	0	7	0	0	0	0	0	4	9	0	1	2	7	3	0	5			

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTProject Name
Big Horn Basin

PROJECT SCHEDULE

CONSTRUCTION AND MAINTENANCE OF ROADS, BUILDINGS AND RECREATION FACILITIES

Project Feature	Unit	Control Field	Activity	Work Code	State	Office	Total		Prior Years		Fiscal Year 65		Fiscal Year 66		Fiscal Year 67		Fiscal Year 68		Fiscal Year 69		Balance to Complete 70 - 74	
							Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)	Units	Cost (\$1000)
Maintenance of Buildings																						
Condition, Survey & Plans	Man Mo.		1 0 9 1 0 2 0 0 4 9 0 1				1 4	7									2	1	2	1	1 0	5
Maintenance Work	Number		1 0 9 1 0 3 0 0 4 9 0 1				1 1	7 2			1	1			1	1	1 1	1 0	1 1	1 0	1 1	5 0
Total - Building Maintenance	Man Mo.		1 0 9 1 0 0 0 0 4 9 0 1				1 4	7 9					1				1	2	1 1	2	1 1	5 5
Maintenance of Recreation Facilities																						
Condition, Survey & Plans	Man Mo.		1 0 9 2 0 2 0 0 4 9 0 1				1 5	1 2							1	1	2	1	2	1	1 0	9
Maintenance Work	Number		1 0 9 2 0 3 0 0 4 9 0 1				7 8	5 8					2	1	5	1	1 0	2	1 5	4	1 8 5	5 0
Studies & Analyses	Man Mo.		1 0 9 2 0 4 0 0 4 9 0 1				1 3	8									1		2	1	1 0	7
Program Services	Man Mo.		1 0 9 2 0 1 0 0 4 9 0 1				7	5									1	1	1	1	5	3
Total - Maintenance of Recreation Facilities	Man Mo.		1 0 9 2 0 0 0 0 4 9 0 1				3 5	8 3					1		1		2	4	5	7	2 5	6 9
Total - Maintenance of Roads, Buildings and Recreation Facilities	Man Mo.				4 9 0 1		7 6	4 6 7					1		3	3	1 3	8	3 2	9	4 4	3 7 4
TOTAL - Construction and Maintenance of Roads, Buildings and Recreation Facilities	Man Mo.						1 9 6 1 6 4 9 5				1 0 4	6 2 3	1 4 8	3 3 1	2 2 3	2 6 6	2 7 4	6 5 4	2 7 4	9 0 0	9 3 8 3 7 2 5	



Photo No. 1. Approximately 43 percent of the public rangelands in the Big Horn Basin is classed in Poor and Bad condition.



Photo No. 2. One-half of the public rangelands in the Big Horn Basin is in Fair condition.



Photo No. 3. Only six percent of the public rangelands in the Big Horn Basin is classed in Good condition.



Photo No. 4. Sagebrush control and fencing for proper livestock control greatly improves range forage conditions.



Photo No. 5. Contour furrowing and reseeding materially enhances the carrying capacity of the public rangelands.



Photo No. 6. Rehabilitation of portions of the public rangelands in the Big Horn Basin will take years due to their depleted condition.



Photo No. 7. Seasonal irrigation of the public rangelands through waterspreading provides improved forage production.



Photo No. 8. Stock water reservoirs provide for more even utilization of the public rangelands.



Photo No. 9. Water control structures, in addition to storing water, help control erosion and reduce downstream sediment loads.



Photo No. 10. Existing access roads in the Big Horn Basin are poorly located and severely eroded, impassable during inclement weather.



Photo No. 11. Improperly designed and maintained roads initiate erosion and lead to deterioration of the public rangeland.



Photo No. 12. Lack of minimum type bridge crossings limits use of access roads to short periods during the summer months.



Photo No. 13. Properly designed graded access roads will open up vast areas of the public lands in the Big Horn Basin to multiple use by the public.



Photo No. 14. Commercial stands of timber located on many portions of the Big Horn Basin public lands will be opened up for harvest and management through construction of minimum standard access roads.



Photo No. 15. Excellent timber improvement sites are located on the public lands within the Big Horn Basin.



Photo No. 16. Oil field plant installations are distributed throughout the Big Horn Basin.



Photo No. 17. Invasion of Halogeton and other weeds has occurred in disturbed areas along oil field pipeline rights-of-way on public lands.



Photo No. 18. Big game frequenting the public lands in the Big Horn Basin offer outstanding hunting opportunities.



Photo No. 19. Recreation opportunities are enhanced through cooperative access agreements with ranchers and private landowners.



Photo No. 20. Roadside picnic areas in the Big Horn Basin are presently limited to a few located on highway rights-of-way.



Photo No. 21. A number of choice recreation locations are available on the public lands in the Big Horn Basin.



Photo No. 22. Considerable demand exists in the Big Horn Basin for small tract developments.



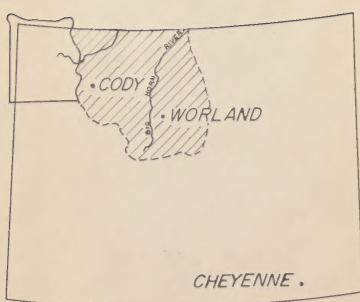
Photo No. 23. Disposal of refuse on the public lands is a serious and continuing problem.



Photo No. 24. Freshly shorn and dipped, sheep are herded onto the public lands.

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P.O. Box 25047
Denver, CO 80225

- LEGEND**
- V Public Domain
 - SD Stock Driveway
 - S State
 - CA Carey Act
 - PS Power Site
 - WR Public Water Reserve
 - RW Reclamation Withdrawal
 -  Geological Structures



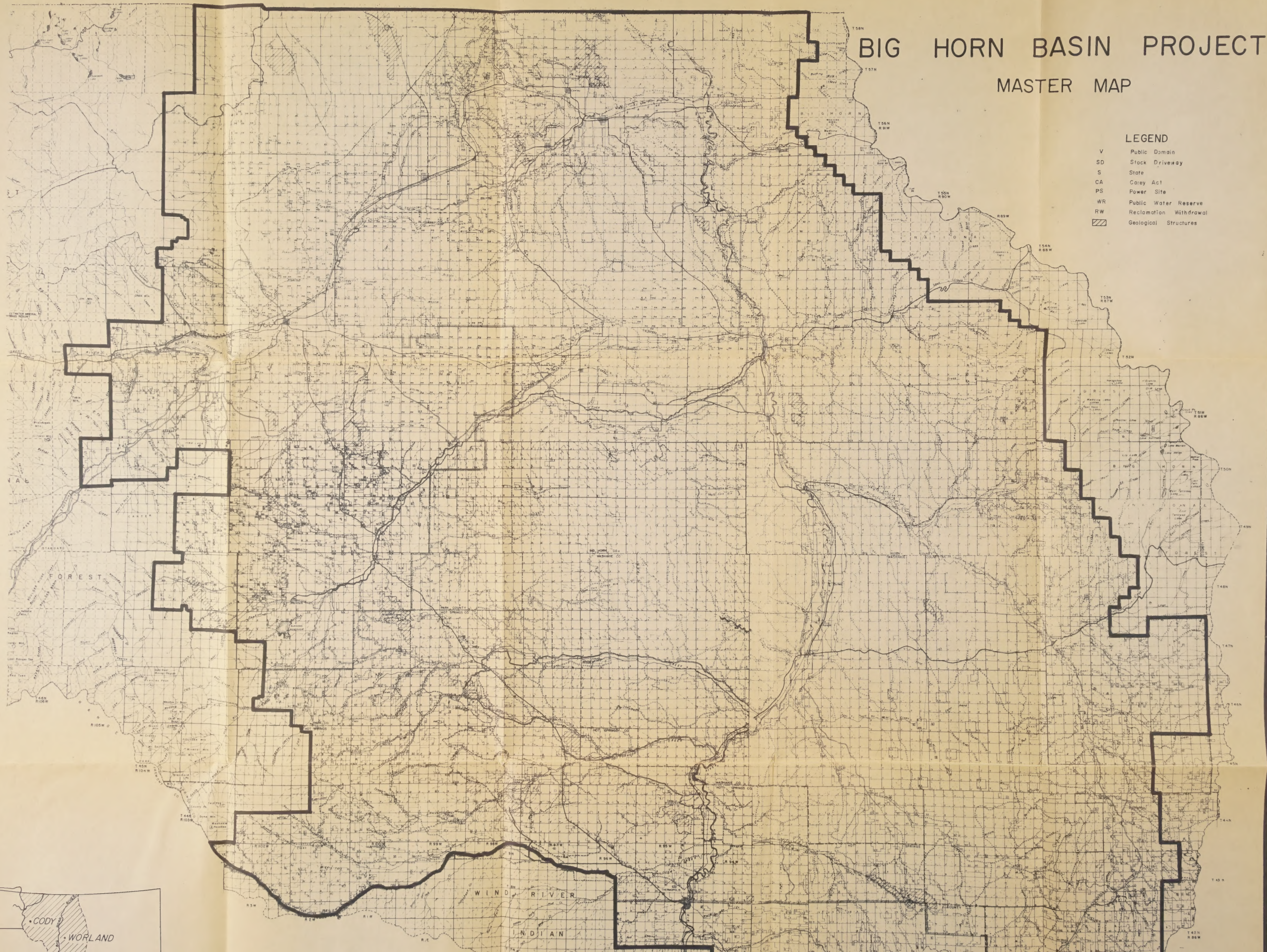
Location Map

BIG HORN BASIN PROJECT

MASTER MAP

LEGEND

- V Public Domain
- SD Stock Driveway
- S State
- CA Carey Act
- PS Power Site
- WR Public Water Reserve
- RW Reclamation Withdrawal
-  Geological Structures



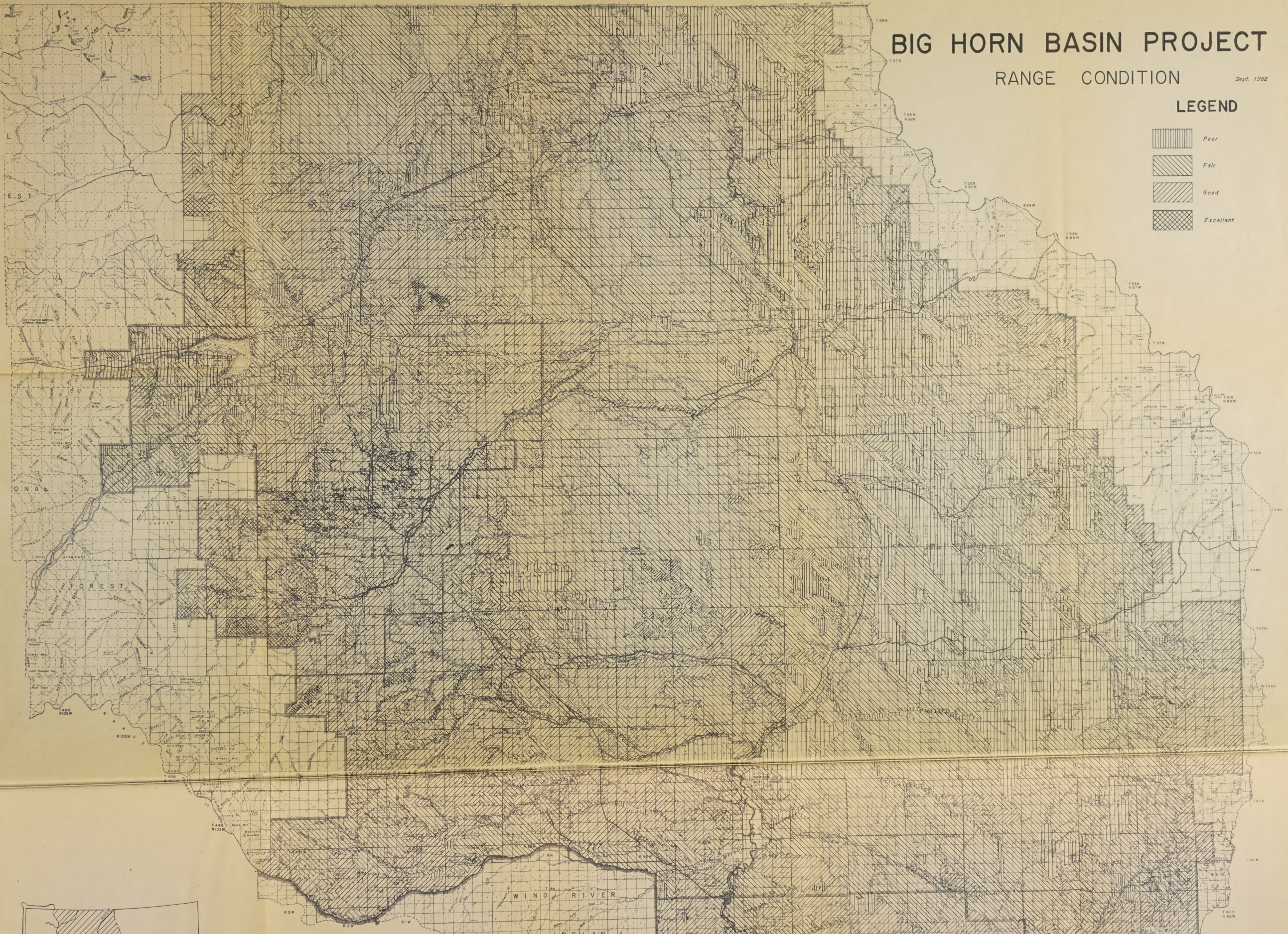
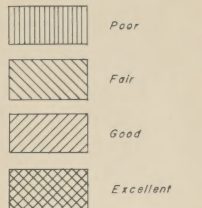
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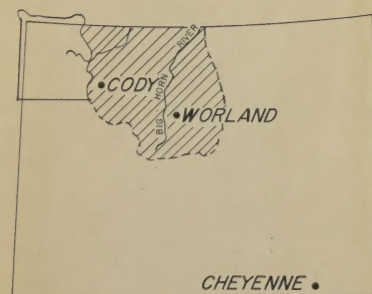
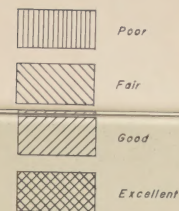
BIG HORN BASIN PROJECT

RANGE CONDITION

Sept. 1962

LEGEND





Location Map

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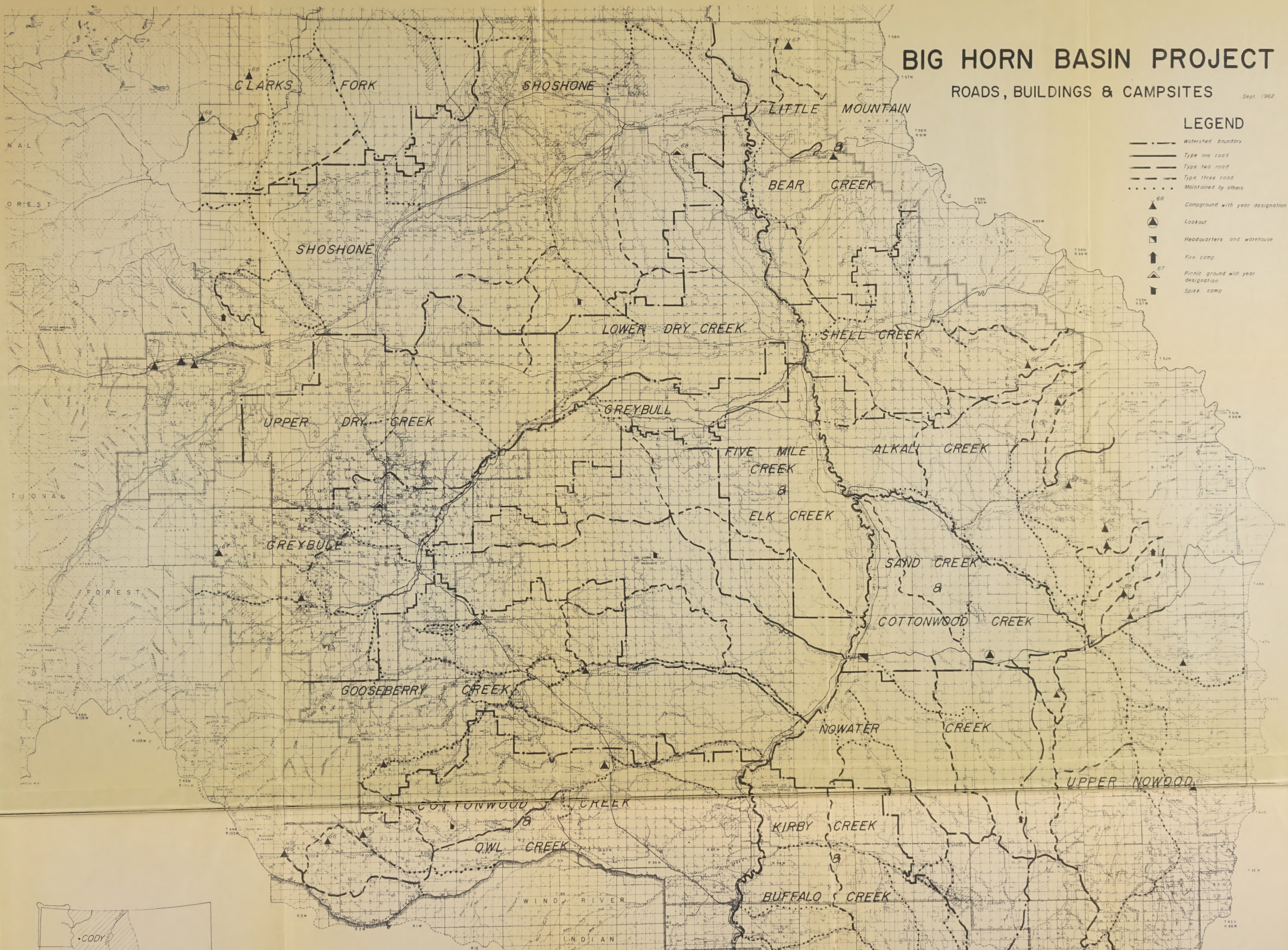
BIG HORN BASIN PROJECT

ROADS, BUILDINGS & CAMPSITES

Sept. 1962

LEGEND

- Watershed boundary
- Type one road
- - - Type two road
- - - Type three road
- Maintained by others
- ▲ 68 Campground with year designation
- ◻ Lookout
- Headquarters and warehouse
- ↑ Fire camp
- ▲ 67 Picnic ground with year designation
- Spike camp





Location Map

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CLARKS FORK

64-68 F.Y.
NO. WATER DEVELOPMENTS 40
MILES FENCING 10

BIG HORN BASIN PROJECT

CONSERVATION DEVELOPMENT WORK MAP

SEPTEMBER 1962

SHOSHONE

64-68 F.Y.
NO. WATER DEVELOPMENTS 200
MILES FENCING 20

LITTLE MOUNTAIN BEAR CREEK

64-68 F.Y.
NO. WATER DEVELOPMENT 120
MILES FENCING 30

LOWER DRY CREEK

64-68 F.Y.
NO. WATER DEVELOPMENTS 20
MILES FENCING 10

SHELL CREEK

64-68 F.Y.
NO. WATER DEVELOPMENTS 90
MILES FENCING 30

UPPER DRY CREEK

64-68 F.Y.
NO. WATER DEVELOPMENTS 60
MILES FENCING 15

ALKALI CREEK

FIVE MILE CREEK

64-68 F.Y.
NO. WATER DEVELOPMENTS 90
MILES FENCING 20
ACRES CONTOURING, SEEDING 2500

BROKENBACKS CREEK

64-68 F.Y.
NO. WATER DEVELOPMENT 150
MILES FENCING 40
ACRES CONTOURING, SEEDING 500
NO. WATER CONTROLS 27

GREYBULL

64-68 F.Y.
NO. WATER DEVELOPMENTS 60
MILES FENCING 15

FIFTEEN MILE CREEK

64-68 F.Y.
NO. WATER DEVELOPMENTS 150
MILES FENCING 40
ACRES OF CONTOURING & SEEDING 15000
NO. WATER CONTROLS 25

SAND CREEK

64-68 F.Y.
NO. WATER DEVELOPMENT 50
MILES FENCING 60
ACRES CONTOURING, SEEDING 3000
NO. WATER CONTROLS 16

COTTONWOOD CREEK

GOOSEBERRY CREEK

64-68 F.Y.
NO. WATER DEVELOPMENTS 140
MILES FENCING 35

NOWATER CREEK

64-68 F.Y.
NO. WATER DEVELOPMENTS 70
MILES FENCING 120
ACRES CONTOURING, SEEDING 3000 15000
ACRES BRUSH CONTROL 10000
NO. WATER CONTROLS 6 12

COTTONWOOD CREEK - OWL CREEK

64-68 F.Y.
NO. WATER DEVELOPMENTS 165
MILES FENCING 15

UPPER NOWOOD

64-68 F.Y.
NO. WATER DEVELOPMENTS 115 140
MILES FENCING 35 35
ACRES CONTOURING, SEEDING 2000
ACRES BRUSH CONTROL 4000

KIRBY CREEK

BUFFALO CREEK

64-68 F.Y.
NO. WATER DEVELOPMENTS 130
MILES FENCING 65
ACRES CONTOURING, SEEDING 6000
ACRES BRUSH CONTROL 6000
NO. WATER CONTROLS 22

LEGEND

- Watershed boundary
- District boundary

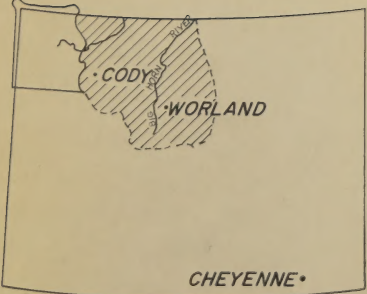
WIND RIVER

INDIAN



LEGEND

- Watershed boundary
- District boundary



Location Map



